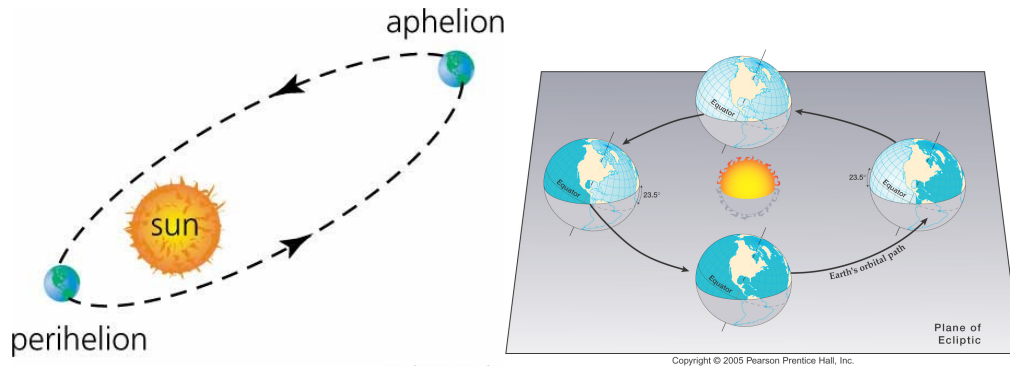


Seasons Lab Questions

Due November 14th, 2016 to your UofIBox folder

Earth's orbit around the Sun is slightly elliptical. At certain times during the year, Earth is a little closer to or farther from the Sun than at other times. Also, Earth is tilted as it moves around the Sun.



- a. Come up with a hypothesis stating why you think the seasons occur.

Do you think they are caused by changes in Earth's distance from the Sun? Do you think Earth's tilt causes the seasons? Do you think both of these factors play a role? Or do you think other factors cause the seasons?

- b. Using a flashlight, measure the area illuminated by a flashlight as a function of tilt angle from 0° (straight up) to 47° . Next, measure the area as a function of distance. Next, measure the area as a function of distance. By what factor must you increase the distance in order to achieve the same increase in area you got when going from 0 to 47° ?

Tilt Angle	0°	25°	47°
Area			

- c. What are the maximum and minimum angles of the sun at noon on the Tropic of Cancer? Did you see a substantial change in light intensity over this range of angles in your experiments?
- d. The perihelion distance is 147 million kilometers (km), the aphelion distance is 153 million km. What percentage change in distance does this represent? Do you see a substantial change in light intensity over this distance?
- e. Considering your responses in c and d above, which of the hypotheses from step a best fit your data? Please explain why we have seasons on Earth, using data from this lab as evidence. Please also draw a diagram that illustrates your explanation by showing the tilt and/or Earth-Sun distance for both equinoxes and solstices on Earth. Be sure to make a drawing for each of Earth's seasons.